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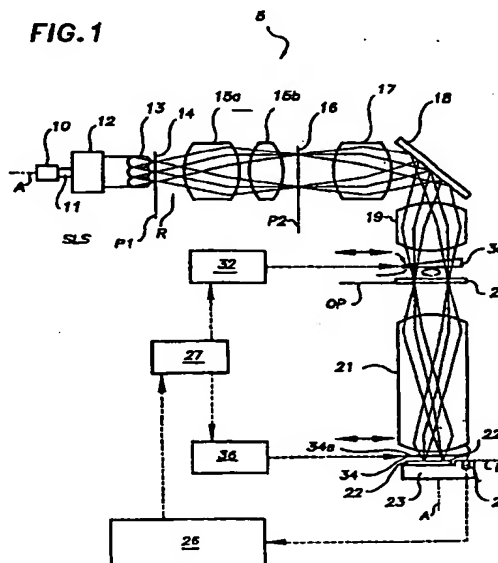
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(54) Optical exposure apparatus and photo-cleaning method

(57) Optical exposure apparatus (5) and methods of using same, for patterning a workpiece and photo-cleaning the optical components in the apparatus, which can be contaminated by moisture and organic compounds in the atmosphere. The apparatus comprises an illumination optical system (10-19) having a light source (10) and one or more optical components, and a projection lens (21) having an object plane (OP) and an image plane (IP) and one or more optical components. The optical exposure apparatus (5) includes an exposure optical path or an exposure light beam through a predetermined space in the optical exposure system. An optical path deflection member for deflecting light is introduced into the exposure optical path so as to create a second optical path that differs from the exposure optical path. Also, a method for photo-cleaning the aforementioned optical components, including the steps of forming an exposure optical path and then changing this path to create a second optical path that differs from the exposure optical path.

FIG. 1



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## EUROPEAN SEARCH REPORT

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Y	* figures 1,17 *	8	
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The present search report has been drawn up for all claims			
Place of search <b>THE HAGUE</b>		Date of completion of the search <b>25 November 1999</b>	Examiner <b>HERYET, C</b>
CATEGORY OF CITED DOCUMENTS X: particularly relevant if taken alone Y: particularly relevant if combined with another document of the same category A: technological background O: non-written disclosure P: intermediate document		T: theory or principle underlying the invention E: earlier patent document, but published on, or after the filing date D: document cited in the application L: document cited for other reasons &: member of the same patent family, corresponding document	

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## EUROPEAN SEARCH REPORT

Application Number  
EP 98 10 7355

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The present search report has been drawn up for all claims			
Place of search <b>THE HAGUE</b>		Date of completion of the search <b>25 November 1999</b>	Examiner <b>HERYET, C</b>
<p><b>CATEGORY OF CITED DOCUMENTS</b></p> <p>X: particularly relevant if taken alone Y: particularly relevant if combined with another document of the same category A: technological background O: non-written disclosure P: intermediate document</p> <p>T: theory or principle underlying the invention E: earlier patent document, but published on, or after the filing date D: document cited in the application L: document cited for other reasons ----- &amp;: member of the same patent family, corresponding document</p>			

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**CLAIMS INCURRING FEES**

The present European patent application comprised at the time of filing more than ten claims.

- ☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):
- ☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

**LACK OF UNITY OF INVENTION**

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

- ☒ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- ☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.
- ☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:
- ☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:



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LACK OF UNITY OF INVENTION  
SHEET B

Application Number

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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. Claims: 1-7, 9-15, 29, 53, 54

Deflection of exposure optical path and prevention of wafer exposure.

2. Claim : 8

Deflection of exposure optical path and light measurement on wafer stage.

3. Claims: 16-18

Illumination system with optional scanning of exposure path.

4. Claims: 19-28

Enlargement of exposure beam.

5. Claims: 30-52, 55, 56

Compensation for change in performance (reflectance or transmittance) of an optical element.

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
The members are as contained in the European Patent Office EDP file on  
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82